

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1-57 (Cancelled)

58. (New) In a method for performing a fast Fourier transform on N ordered inputs in n stages, the improvement comprising

- A. performing an  $n^{\text{th}}$ , final stage of butterfly calculations by the steps of
  - i. executing a first loop in which a portion of the final stage butterfly calculations are performed by (a) invoking butterfly calculation logic, and (b) storing outputs generated by that logic in shuffled order in place of the selected inputs to result in a correct ordering of transform outputs; and
  - ii. executing a second loop in which a remaining portion of the final stage butterfly calculations is performed by (a) invoking butterfly calculation logic to execute two sets of butterfly calculations, (b) storing outputs generated by that logic from a first one of the two sets in shuffled order in place of the inputs for a second one of the two sets of butterfly calculations, and (c) storing outputs generated by that logic from the second one of the two sets of butterfly calculations in shuffled order in place of the inputs selected for the first one of the two sets of butterfly calculations to result in a correct ordering of transform outputs,
- B. wherein the method performs the fast Fourier transform on N ordered inputs in n stages without invoking logic for shuffling order of inputs or outputs other than as is recited in step (A).

59. (New) A method for performing a fast Fourier transform on N ordered inputs in n stages, the improvement comprising:

- A. performing in-place butterfly calculations for n-1 stages;

- B. performing a final stage of butterfly calculations by the steps of
- i. executing a first loop in which a portion of the final stage butterfly calculations are performed by (a) invoking butterfly calculation logic, and (b) storing outputs generated by that logic in shuffled order in place of the selected inputs to result in a correct ordering of transform outputs; and
  - ii. executing a second loop in which a remaining portion of the final stage butterfly calculations is performed by (a) invoking butterfly calculation logic to execute two sets of butterfly calculations, (b) storing outputs generated by that logic from a first one of the two sets in shuffled order in place of the inputs for a second one of the two sets of butterfly calculations, and (c) storing outputs generated by that logic from the second one of the two sets of butterfly calculations in shuffled order in place of the inputs selected for the first one of the two sets of butterfly calculations to result in a correct ordering of transform outputs,
- C. wherein the method performs the fast Fourier transform on  $N$  ordered inputs in  $n$  stages without invoking logic for shuffling order of inputs or outputs other than as is recited in steps (A) and (B).